FUKS, G.B., inzh.; POKRASS, L.I., inzh.

Precast reinforced concrete rectangular pipes. Avt.dor. 23
no.3:25-26 Mr '60.   (MIRA 13:6)
                    (Culverts)

L 26377-66

ACC NR: AP6007660   (A)   SOURCE CODE: UR/0413/66/000/003/0028/0028

AUTHORS: Barenboym, I. Yu.; Dubrova, Ye. P.; Vasil'yev, V. D.; Lurik, N. M.;
Radzevich, Ye. N.; Spitkovskiy, S. A.; Fuks, G. B.; Fel'dman, M. B.; Leybman,
Ya. M.; Kolomoytsev, B. B.; Flaks, V. A.; Khandzhi, V. V.; Gol'dfel'd, L. M.;
Lifshits, I. L.

ORG: none

TITLE: A means of erecting railroad bridges of arched-span construction from
separate sections. Class 19, No. 178393

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 3, 1966, 28

TOPIC TAGS: bridge, bridge construction, structural engineering, railroad bridge,
cantilever bridge

ABSTRACT: This Author Certificate presents a means for erecting railroad bridges of
arched span construction from separate sections. The sections are suspended and
joined with struts of the structure above the arch by temporary sloping and horizontal
members. These members serve as cross-stays and upper booms. The sections also
feature a cantilever truss (see Fig. 1) with a triangular framing, the lower girder
of which forms a semi-arch. The upper girder of the cantilever truss is set above
the travel span, which includes separate elements of the truss used in mounting and
elevating the structure. These members subsequently form a triangular cantilever

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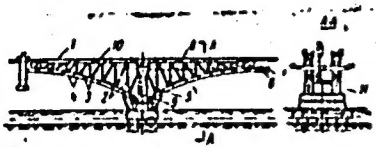
L 26377-66

ACC NR: AP6007660

Fig. 1. 1 - upper string of the cantilever truss; 2 - struts; 3 - slanting members; 4 - lower string panels; 5 - anchor post; 6 - key block; 7 - floor plates; 8 - cables; 9 - anchor block; 10 - tension cables; 11 - joints.

frame, cross-stays and semi-arch sections. Each panel thus formed serves as a support for the next panel. The panels are rigidly fastened along the entire face, the process being repeated until the entire semi-arch is formed. Then cables are placed between the link sections and the support. When the cables are tightened, the semi-arches are rotated with respect to the support section, thus unloading the diagonal and horizontal members of the cantilever. The cables are removed, after which the travel-span plates are placed upon the structure above the arch between the link sections of the semi-arch and the support. When the wearing surface is completely laid, the remaining part of the cables is tightened. Favorable working conditions for the support are created by freeing the support from one-sided loadings; assembly of the semi-arch takes place simultaneously on both sides of the pier, with each addition being a cantilever addition. The abutment portion of the semi-arch is prepared in place between the first support block of the semi-arch and the pier. Forces in members of the cantilever are lessened by the introduction of stiffener cables in the upper girder at 1/2--2/3 of its design length. Moments in panels on the semi-arch are reduced through a skewed arrangement of axes of diagonals relative to points of intersection of the axes of vertical members and the semi-arch blocks. Joints are placed between adjacent semi-arches on the assembled panels, thus controlling the position of cantilever frames in the span. Orig. art. has: 1 figure.

Card 2/2 SUB CODE: 13/ SUBM DATE: 14Nov64

FUKS, Georg, prof. doktor meditsiny i filosofii

Roentgenotherapy for malignant tumors during surgery. Vest. rent.
i rad. 36 no. 2:3-9 Mr-Ap '61.   (MIRA 14:4)

1. Iz TSentral'nogo rentgenologicheskogo instituta pri gospitale
imperatora Frantsa Iosifa v Vene.
            (CANCER)   (X RAYS—THERAPEUTIC USE)

FUKS, G., inzh.

Better utilization of wood in construction. Avt.dor. 24 no.4:30
Ap '61.   (MIRA 14:5)
                         (Wood)

FUKS, G.I., doktor tekhn.nauk, prof.; BOYKOV, G.P., kand.tekhn.nauk, dotsent

Determination of the degree of blackness using two reference standards. Izv.vys.ucheb.zav.; energ. 5 no.11:88-90 N '62.

(MIRA 15:12)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut imeni S.M. Kirova. Predstavlena kafedroy teoreticheskikh osnov teplotekhniki.

(Heat—Transmission)

CA I 15

PROCESSES AND PROPERTIES INDEX

Structure of soil colloids. I. Structure of colloidal ferric hydroxide. A. I. Rabinerson and G. E. Fuks. *Proc. Leningrad Dept. Godrois Inst. Feri. 22, 1-56(1933);* cf. C. A. 25, 3436.—A classification of soil colloids is suggested which depends on (a) slow coagulation with a local lowering of the ζ potential (Fe(OH)₃, Al(OH)₃), or (b) expansion of the sheath of hydration (bentonite, solonetz).

R. C. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

BC

a-1

Viscosimetric investigations of structure form-ation in ferric hydroxide sols. III. Destruction of ferric hydroxide sols on dilution. G. Fuchs and Z. Karpova (Acta Physicochim. U.R.S.S., 1935, 3, 127—138).—The destruction of young and aged conc. Fe(OH)$_3$ sols and gels on dilution has been studied. The effect of adding FeCl$_3$ was also ex-amined. The viscosity data indicate the existence of structures of different ages and solidity in the sol particles, which may be termed primary and secondary structures. The mechanism of destruction consists in the breakdown of secondary structures and dis-placement of the adsorption equilibrium with dilution.

A. J. M.

AIR-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

PROCESSES AND PROPERTIES INDEX

The pressure viscometry of kaolin suspensions. G. Fuks. *Acta Physicochim. U. R. S. S.* 3, 137-46 (1935) (in German).—Viscosity (η) increases rapidly with concn. That of sols reaches a max. after aging and then falls off. The maxima for the 5.32 and 10.43% sols come after 5 days and 4 days, resp., while for a 14.72% sol η falls off from the beginning. Mech. working increases aggregation. The greater the dispersion the more rapid the structure formation. Diln. causes coagulation. Dehydrating agents hasten the formation of structures.

R. E. DeRight

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Spontaneous structure formation in ferric hydroxide sols. P. Fuks and A. Rabinerson. *Acta Physicochim. U. R. S. S.* 4, 441–52 (1936) (in German); cf. *C. A.* 29, 7756[1]. The change in cond. and p_H of freshly prepd. $Fe(OH)_3$ sols with time is attributed to slow hydrolysis of ferric salt in the intermicellar liquid. Equil. is reached in 5-6 days. Hydrolysis induced by heating the sol is only partially reversed on cooling, owing to a decrease in dispersion. Structure formation varies directly with degree of hydrolysis and is accounted for by desorption of the ferric ion. The velocity of coagulation after hydrolytic equil. is reached depends on the value of the zeta potential corresponding to the degree of desorption finally established.

L. W. Rider

ASM-SLA   METALLURGICAL LITERATURE CLASSIFICATION

Obituary of A. I. Rabinerson. G. I. Fuks. Kolloid.
Zhur. 10, 60-71(1948).—R. died in 1943 during the siege
of Leningrad.   J. J. Bikerman

PROCESSES AND PROPERTIES MODE

Structured ferric hydroxide sols obeying Poiseuille's law.
O. L. Fuks. *Kolloid. Zhur.* 10, 155-8(1948).— Fe(OH)₃
hydroxide of 0.3-0.6% Fe₂O₃ prepd. by diln. of old concd.
sols showed initially anomalous viscosity η; over 3-10
days η fell and the anomalous pressure range decreased.
At the end of that period slow increase of η set in again and
was observed for 6 months; however, η did not attain the
initial value (in the Poiseuille region) of the freshly dild.
sols. At the end of the 10-day period of falling η, all sols
except one were found to obey Poiseuille's law up to the
turbulence limit, whereas sols prepd. directly from Merck's
colloidal Fe(OH)₃ showed, at the same stage, anomalies
at low pressures, at least in viscometers with a narrower
capillary. The normal sols remain so for several months
despite the slow rise of η, and hints of anomalies appear
only towards the end of the aging period. Presence of a
structure in the normal sols is evidenced not only by the
slow increase of η but also by its abnormal concn. dependence, and by a sharp lowering of the crit. value of the
Reynolds no. as compared with H₂O. Addn. of 12-30
milliequiv. NaCl to the normal sols raises η and develops
anomalous viscosity; addn. of Aℓⁿⁿⁿ, KOH or heating at
80-100° has the same effect. Higher concns. of electrolyte
or prolonged heating transform the sol into a gel. The
thixotrable supermicellar structure present in the aging
normal sols may be related to Heller's "gekoids" (C.A.
36, 311°; 37, 860°). N. Thon

METALLURGICAL LITERATURE CLASSIFICATION

28

Investigation of Viscosity of Solutions of Polyisobuty-
lenes in Mineral Oils. I. Relationship of Viscosity to
Concentration and Molecular Weight. (In Russian.)
G. I. Fuks and N. G. Puchkov. Kolloidnyi Zhurnal
(Colloid Journal), v. 10, Sept.-Oct. 1948, p. 371-381.

Proposes equations for the above relationship. It
was found that Staudinger's equation could not be
applied to the linear dependence of specific and
relative viscosities on molecular weight in a wide
range of concentration. The proposed generalized
equation permits this determination. Data are
tabulated and charted. 14 ref.

Physicochem Lab., Tethretsneft

2

Viscosity of polyisobutylene solutions in mineral oils.
II. Temperature dependence of viscosity. G. L. Fuks
and N. G. Puchkov. Kolloid. Zhur. 11, 34-43(1949);
cf. Kolloid. Zhur. 10, 171(1918). — Viscosity of some min-
eral oils and of solns. of polyisobutylene (I) in these oils
follows the equation (cf. Ramaiya, Trudy N.I.I 45, 5
(1947)) logη = [A + (B/T)]^2 between −45° and 130°
but the consts. A and B suddenly change at about −30°
to 10°. The relative η of the solns. decreases when the
temp. increases. Solns. of different types of I adjusted for
an equal η have a greater temp. coeff. of η the smaller the
mol. wt. of I. Dil. solns. of I (1.5-2%) have the same
yield point and the same temp. of liquefaction as the sol-
vent oils.
J. J. Ritter...

Method for Viscosity Determination of Colloidal Solutions and Suspensions Possessing Anomalous Viscosity. (In Russian.) G. I. Fuks and T. A. Mechkovskaya. *Zavodskaya Laboratoriya* (Factory Laboratory), v. 15, Apr. 1940, p. 430-436.

Describes and diagrams simple capillary viscometer particularly suitable for investigation of salts, suspensions, and solutions of high polymers possessing anomalous viscosity. Typical data are tabulated and charted.

FYS, G. I.

24488 I klychnov, V. M. vliyaniye nizkikh kontsertratsiy elektrolitov na stseplenic mikroskopicheeskikh pochvennykh chastits. Trudy vsesoyuz,. Nauch-Issled, In-ta udobreniy, agrotekhniki i agropochvovedeniya, im. Gedroytsa, vyp. 29, 1949, c. 16-25. Bibliogr: 11 nazv.

SO: LETOPIS' NO. 35, 1949

FUKS, G. I.

PA 39/49T11

USSR/Chemistry - Suspension   Mar 49
        Chemistry - Dispersed Systems

"The Adherence of Microscopic Particles to the
Hard Surface of Liquids," G. I. Fuks, V. M.
Klychnikov, Ye. V. Tayganova, All-Union Sci
Res Inst for Fertilizers, Agrotech, and Soil
Studies imeni K. K. Gedroyts, 4 pp

"Dok Ak Nauk SSSR" Vol LXV, No 3

Studied adherence of monodispersed suspensions
of quartz, glass, graphite, clay, soils, and
resin to quartz, glass, metals, paraffin in water,
mineral oils, and several other liquids. Sub-
mitted by Acad P. A. Rebinder, 3 Jan 49.
                                            39/49T11

FUKS G. I.

IX 151T93

USSR/Physics - Emulsions, Sols 21 Jun 49

"Flow of Dilute Structured Sols and Suspensions," G. I. Fuks, 4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 6

Studied flow of 0.05-0.5% V_2O_5 hydrosols, 0.2-1.5% Graham sols Fe(OH)3, 0.2-1.2% rubber solutions in a kerosene fraction (boiling point 200-320°), ceresin suspensions in medicinal vaseline oil and xylene and 0.1-2.5% water suspensions of bentonite and kaolin, saturated with Na', K', H', and Ca' ions. Constructed special unit for this study, consisting of two coaxial cylinders, between which liquid under study was placed. Inner cylinder (radius 37 mm) was rotated at a constant speed (2.3 and 6 rpm). Motion of liquid was observed with the aid of particles (carbon, graphite, ZnO, aluminum) 0.5 μm in diameter deposited on the surface of the liquid. Distance between cylinders was 51 mm. Particles were placed along the radii every 3 or 1.5 mm. Submitted by Acad P. A. Rebinder 26 Apr 49.

USSR/Physics - Emulsions (Contd) 21 Jun 49

151T93

MITROFANOVA, I. A.

"Improving the Viscosity and Temperature Properties of Lubricating Oils by Compounding Fractions", p 111, in the Monograph "Investigationand Use of Petroleum Products", edited by N. G. Puchkov, Gostoptekhizdat, Moscow-Leningrad, 1950.

Aggregative stability and supermicellar structure. O.
L. Kuhn. Kolloid. Zhur. 12, 228-34(1950); cf. preceding
abstr.—A review, mainly of Peskov's work.   J. J. B.

FUKS, G.I.; KUSAKOV, M.M., professor, redaktor; L'VOVA, L.A., vedushchiy
redaktor; POLOSINA, A.S., tekhnicheskiy redaktor

[Viscosity and plasticity of petroleum products] Viazkost' i
plastichnost' nefteproduktov. Pod red. M.M.Kusakova. Moskva,
Gos. nauchno-tekhn. izd-vo neftianoi i gorno-toplivnoi lit-ry,
1951. 27 p. [Microfilm]
        (Petroleum products)   (MIRA 10:1)

MINASYAN, M.A., inzhener; FUKS, G.I., kandidat khimicheskikh nauk.

Fat base for fine lubricating oils. Masl.-zhir.prom. 18 no.6:15-16 Je
'53.
                                                  (MLRA 6:6)

1. Trest "Krasnodarzhirmaslo" (for Minasyan). 2. Nauchno-issledovatel'-
skiy institut chasovoy promyshlennosti (for Fuks).
                              (Lubrication and lubricants)

FUKS, G.I.; SANDOMIRSKIY, D.M.

Third All-Union Conference on Colloidal Chemistry. Koll.zhur. 16
no.2:154-160 '54.

(MLRA 7:3)
(Colloids)

FUKS, G.I.

USSR/Chemical Technology - Chemical Products and Their   I-13
          Application. Treatment of Natural Gases and Petroleum.
          Motor Fuels. Lubricants.

Abs Jour   : Referat Zhur - Khimiya, No 4, 1957, 12975

Author   : Fuks G.I., Gal'tsova N.Ye. Uss I.I.
Title   : Low-Viscosity Watch Oils

Orig Pub   : Chasovyye mekhanizmy, Sb. 1, M., Mashgiz, 1955, 165-185

Abstract   : Preparation of low-viscosity oils for clockwork mecha-
             nisms, from oils of medium viscosity, can be effected
             by three methods: dilution with low viscosity synthe-
             tic components, removal of viscous components of fat
             by freezing or by adsorption separation (decrease in vis-
             cosity of bone oil, that is attained thereby, does not ex-
             ceed 16%), chemical treatment of the oil involving ester
             interchange of fatty acid glycerides.
             Bibliography, 28 references.

Card 1/1   - 260 -

FUKS, G.I.

AUTHOR: Fuks, G. I.

TITLE: The Lubricating Qualities of Instrument Lubricants.
           (Smazochnaya sposobnost' pribornykh masel)

PERIODICAL: Chasovyye mekhanizmy. Sb. 1, Moscow, Mashgiz, 1955, pp 186-215

ABSTRACT: The author reaches the conclusion that the lubricating qualities of a
           lubricant are determined by the interaction of the liquid molecules and
           the surface of the solid body, as well as by the capability of the thin
           layer of liquid to support heavy normal loads and to offer small resist-
           ance against tangential displacements. Therefore, lubricating qualities
           must be evaluated in terms of two quantities: 1) the resistance offered
           ty a thin layer of liquid to normal and tangential stresses, or 2) the
           ratio of the one to the other. This ratio equals unity throughout the
           liquid, except that it grows within the boundary layer of the liquid.
           Four methods were developed for the investigation of the mechanical
           characteristics of the liquid boundary layer. One of these methods is
           based on the utilization of a variant of the four-bead device for the
           measurement of friction. The three other testing devices have been

Card 1/3

124-11-12792

The Lubricating Qualities of Instrument Lubricants (continued).

developed for the investigation of the statics and kinematics of the phenomenon of adhesion. One of the investigational methods developed permits the simultaneous determination of the clearance between surfaces in mutual contact and the reaction of thin liquid layers against normal loads.

The investigation shows that the friction coefficients of lubricated surfaces depend on the load, and that hence the Coulomb-Amanton law of friction does not apply here. Its characteristics are characterized with adequate accuracy by Deryagin's two-term expression. The investigation of the kinetics of adhesion of plane-parallel lubricated disks indicates that the thin layer of lubricant in the interstice between the metallic surfaces may be divided in three parts, according to their mechanical characteristics: 1) a plastic-viscous part, adhering to the metal; 2) a layer in which the viscosity is higher than average; 3) a layer in which the reference value of the viscosity prevails. The first and second layers constitute the boundary layer of the lubricant, the thickness of which does not exceed 0.40 micron. It is shown that the lubricating quality of a lubricant depends on its composition. It is greater in animal than in mineral fats, without, however, exhibiting

Card 2/3

124-11-12792

The Lubricating Qualities of Instrument Lubricants (continued)

>   any direct additive characteristics in mixtures of the two types of fats.
>   The introduction of animal fats and, more especially, animal acids and
>   other superficially active substances to mineral fats reduces the tan-
>   gential and increases the normal components of the lubricating quali-
>   ties of the lubricants, wherein the effectiveness of these additives
>   depends greatly on the precise composition of the lubricant and the
>   additives.   (B. G. Zaloga)

Card 3/3

FUKS, G.I.

Investigating the mechanical properties of liquid films in the
space between solids. Zav.lab. 21 no.12:1455-1461 '55.(MIRA 9:4)
                (Films (Chemistry))

FUKS, G.I.

124-58-6-6872

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 6, p 88 (USSR)

AUTHOR: Fuks, G.I.

TITLE: Investigation of Solid-particle Interaction in a Liquid by Methods
of Adhesion and Friction Measurement (Issledovaniye vzaimodey-
stviya tverdykh chastits v zhidkosti metodami izmereniya prilipa-
niya i treniya)

PERIODICAL: V sb. Tr. 3-y Vses. konferentsii po kolloidn. khimii, 1953,
Moscow, AN SSSR, 1956, pp 301-328

ABSTRACT: A brief survey is given of the problem of the interaction of highly
dispersed particles in a liquid. Results are presented of the
author's experiments on solid-particle interaction in a liquid by
applying the following methods: 1) measurement of the static and
kinetic adhesion of plane-parallel disks for various distances bet-
ween them and rectangularly crossed threads; 2) measurements
of the friction of beads in a liquid for varying loading and duration
of contact. The variation in the temperature dependence of the
disk separation time in mineral oils and the estimated liquid-flow
activation energy for various clearances confirm the conclusion
that the liquid boundary layers in contact with solid bodies possess
a structure and mechanical properties different from the properties

Card 1/2

124-58-6-6872

Investigation of Solid-particle Interaction in a Liquid (cont.)

of the bulk of the liquid. It is noted that friction and adhesion in a liquid for average distances between bodies in contact do not depend on the second coefficient of viscosity (thick or fluid-film viscosity) of the liquid. It is shown that adhesion increases substantially with an increase in contact time and in specific loading; increased loading, addition of surface-tension reducing substances, and electrolytes lower the coefficient of friction. Bibliography: 61 references.

N.F.Bondarenko

1. Boundary layers--Physical properties   2. Boundary layers--Mechanical properties   3. Liquids--Properties   4. Adhesion--Analysis   5. Friction--Analysis

Card 2/2

FUKS, G. I.

"Study of the Interaction of Heavy Particles in Liquid by the Method of Measuring the Adherence and Friction" (Issledovaniye vzaimodeystviya tverdykh chastits v zhidkosti metodami izmereniya prilipaniya i treniya) from the book Trudy of the Third All-Union Conference on Colloid Chemistry, pp.301-328, Iz. AN SSSR, Moscow, 1956

(Report given at above Conference, Minsk, 21-4 Dec 53)

FUKS, G.I

REBINDER,P.A., akademik, otvetstvennyy redaktor; YERMOLENKO, N.F.,
        otvetstvennyy redaktor; KARGIN, V.A., akademik, redaktor; DUMANSKIY,
        A.V., redaktor; DERYAGIN, B.V., redaktor; DOGADKIN, B.A., professor,
        redaktor; FUKS, G.I., redaktor; YEGOROV, N.G., redaktor izdatel'stva;
        MOSKVICHEVA, N.I., tekhnicheskiy redaktor

[Proceedings of the Third All-Union Conference on Colloidal Chemistry]
Trudy Tret'ei Vsesoiuznoi konferentsii po kolloidnoi khimii. Moskva,
Izd-vo Akademii nauk SSSR, 1956. 494 p.   (MLRA 9:11)

1. Vsesoyuznaya konferentsiia po kolloidnoy khimii, 3d, Minsk, 1953.
2. Chlen-korrespondent AN SSSR (for Dumanskiy, Deryagin) 3.
Deystvitel'nyy chlen AN SSSR (for Yermolenko)
        (Colloids)

FUKS, G. I.

993. FOUR BALL APPARATUS FOR STUDYING THE ANTI-FRICTION AND ANTI-WEAR PROPERTIES OF LUBRICANTS. FUKS, G.I.
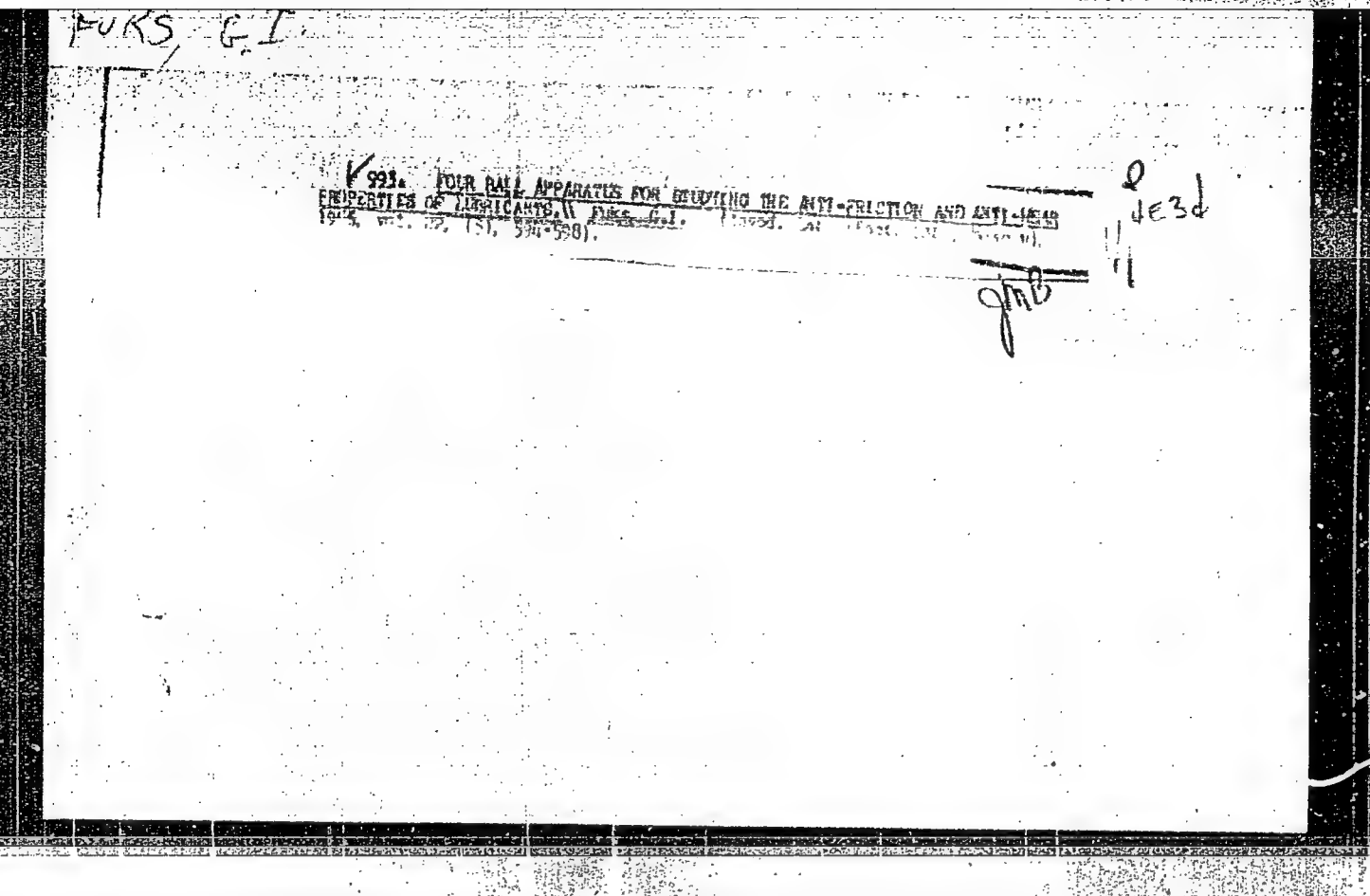
Fuks, G. I.

Methods of investigation of lubricating oils at moderate temperatures. G. I. Fuks and N. F. Gal'tsova. *Zavod. Lab.* 22, 1455 (1956).—A special app. was devised for the study of the oxidation of lubricants in thin layers at 25–100° (usually at 60 ± 1°) and with a bright illumination. Changes in viscosity, acidity, and the peroxide no. in 24 hrs. at 60° were detd. under mild oxidation conditions as oxidation indexes in the presence of antioxidants, and under manufg. conditions. The tests showed that the peroxide no. was the most rapidly affected, acidity slower, and the viscosity the slowest. — W. M. Strobusz

Sci. Res. Inst. Watch Industry

Fuk, *G.I.*

LOSIKOV,B.V.,prof,red;KREYN,S.E.prof.red; FUKS, G.I., kand.khim.nauk; red.;
LOSBYAKOVA, Ye.S., vedushchiy redaktor; MOKHINA, E.A., tekhn.red.

[Improvement in the quality and the use of lubricants; a collection
of papers] Povyshenie kachestva i primenenie smazochnykh materialov;
sbornik dokladov. Moskva, Gos.nauchno-tekhn.izd-vo neft.i gorno-
toplivnoi lit-ry, 1957, 364 p.   (MIRA 10:12)

1. Moskovskiy dom nauchno-tekhnicheskoy propagandy imeni
F.E.Dzerzhinskogo.
                    (Lubrication and lubricants)

FUKS, G. I.

Oxidation of lubricating oils at low and medium temperatures. G. I. Fuks and N. E. Gal'tsova. *Khim. i Tekh. Topliv i Masel* 1957, No. 6, 23-37.—The oxidation behavior of the following oils was studied: petroleum lubricating oil, turbine oil, transformer oils, and their vacuum distillates, a synthetic lubricant (dioctyl sebacate), bone oil, castor oil, oleic acid, some special lubricating oils. The oxidation of transformer and bone oils was studied in the greatest detail. O₂ is being used at low or medium temps., and with changes in viscosity and chem. compn. Oxidation progresses in 3 stages: induction period; accumulation of primary oxidation products and acids, often accompanied by a slight viscosity drop; decrease in the concn. of primary oxidation products and formation of secondary products, resulting in a viscosity rise. Oxidation takes place even at low temps., and the general nature of oxidation is not detd. by temp. in the −50 to +100° range, although the rate and the transition time into the upper oxidation stages are accelerated by a rise in temp. Mineral oils are more stable at temps. below 100° than are the fatty oils, but the difference in stability is reduced by an increase in temp. Stability is increased by distn. Anti-oxidants are effective at low and medium temps., and p-hydroxydiphenylamine is particularly effective with fatty oil lubricants.

W. M. Sternberg.

FUKS, G.I.

MIKHAYLYUK, A.S., inzhener; FUKS, G.I., kand.khim.nauk.

Wear of materials used for making supports and axles of precision
instruments. Priborostroenie no.9:18-21 S '57.   (MIRA 10:10)
(Mechanical wear)

AUTHOR   FUKS G.I.
TITLE   Motion of Liquids in Narrow Clearances Between Flat Solids Approach-   PA - 3165
                ing Each Other.
                (O techenii zhidkostey v uzkikh zazorakh mezhdu sblizhayushchim-
PERIODICAL   isya ploskimi tverdymi telami -Russian).
                Doklady Akademii Nauk SSR,1957,Vol 113,Nr 3,pp 635-638 (U.S.S.R.)
                Received 6/1957   Reviewed 7/1957

ABSTRACT   In some of the author-s previous papers (Zav.Lab.21,12,1455,1955
                and others) it was shown that the equation of Stephan (Zs.Ber.Akad.
                Wissen.69,713,1874) and Reynolds (Phil.Trans.Roy.Soc.177,157,1886)
                is not satisfied in the case of disks which are separatedby suffi-
                ciently thin layers of mineral-and other lubricating oils, by stea-
                ric acid-solutions in organic solvents, and by aqueous solutions of
                electrolytes. In more recent experiments the following deviations
                from the equation were determined on the occasion of the circula-
                tion of the aforementioned liquids in narrow clearances: 1.) re-
                tarded flow in or-out of the liquid in the clearance. 2.) formation
                of a rest layer which cannot be pressed out in the case of a charge
                up to 8 kg/Qmm within 36 hours. 3.) rise of t (time of approach, of
                stripping resp. of the flat-parallel disks) in the case of an increa-
                se of the length of contact. 4.) nonlinear dependence of time on $1/F$
Card 1/2   and $1/h_1^2$. (h_1= the primary clearance, F= the normal (vertical) for-
                ce which approaches or separates the disks). At the boundary between

                solid and liquid specifically molecular-surface properties were found.
                This indicates the dependence of the effect on the surface-active-sub-
                stances and on the electrolytes. It proves the formation of a spe-
                cial structure of the surface - layer in the case of the investigat-
                ed liquids in a depth of the order of $0,16\mu$. The nature of the desc-
                ribed effect is inhomogeneous and is, in particular, determined by
                not - balanced and balanced phenomena. (4 illustrations, 2 tables
                and 10 citations from Slavic publications).

AUTHORS: Fuks, G.I., Timofeyeva, L.V.   32-24-4-19/67

TITLE: A Method for the Estimation of the Corrosion Aggressivity of
             Lubricating Oil at Moderate Temperatures (Metod otsenki
             korrozionnoy agressivnosti smazochnykh masel pri umerennoy
             temperature)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 4, pp. 427-429 (USSR)

ABSTRACT: The standard method according to GOST-7934-56 hitherto in use re-
             quired an investigation lasting 30 days; in order to avoid this
             loss of time a new investigation method was developed in two
             varieties. The new method was worked out in consideration of the
             fact that a change of temperature from 20° to $80-100^\circ C$ causes
             acceleration of oxidation but no change of the oils, and, in ac-
             cordance with the electrochemical character of corrosion, that in
             the case of contact being established between two metals of dif-
             ferent kind, acceleration of corrosion takes place too. As may be
             seen from a schematical drawing test vessels of cylindrical shape
             and certain dimensions containing the metal to be investigated
Card 1/2   are mounted on a revolving wheel in the oil. The difference between

A Method for the Estimation of the Corrosion
Aggressivity of Lubricating Oil at Moderate
Temperatures

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the two varieties of this method is mainly caused by the shape of
the test vessel and thus of the oil level. Experiments showed that
brass corrodes sooner than steel, and that a simultaneous presence
of both metals increases the velocity of corrosion still more. A
rise of temperature as well as the presence of moisture increases
corrosion in accordance with the aggressivity of the oil. The
sensitivity of the method exceeds the standard method because, e.g.,
the influence exercised by 0.01% of water in oil upon corrosion is
noticeable. Investigation results showed among other things that
a 72 hours' test at 75° according to the first variety corresponds
to a 30 days' test according to the standard method, as well as to
natural wear at $20-50^\circ$ for a period of 2-3 years in clockworks. A
further saving of time was made possible by employing the second
variety. There are 3 figures, 2 tables, and 2 references, 2 of which
are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut chasovoy promyshlennosti
(Scientific Research Institute of the Clock- and Watch Industry)

1. Lubricating oils--Corrosive effec   2. Lubricating oils
--Temperature factors   3. Metals--

Card 2/2

AUTHOR: Fuks, G.I.   SOV/69-20-6-13/15

TITLE: The Investigation of the Boundary Friction and Adhesion With
            the Purpose of Studying the Interaction of Highly Dispersed
            Particles (Issledovaniye granichnogo treniya i prilipaniya s
            tsel'yu izucheniya vzaimodeystviya vysokodispersnykh chas-
            tits). 1. Some Boundary Properties of Solutions in Narrow
            Flat Clearances Between Solid Planes (1. O nekotorykh granich-
            nykh svoystvakh rastvorov v uzkikh ploskikh zazorakh mezhdu
            tverdymi telami)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol 20., Nr 6, pp 748-758 (USSR)

ABSTRACT: Friction and adhesion of solid bodies in liquids is measur-
            ed to study the lubrication properties of these liquids.
            The interaction of solid bodies of simple geometric form in
            aqueous solutions of electrolytes, surface-active sub-
            stances, etc. is here investigated. Figure 1 shows the
            attraction forces of discs separated by turbine oil and
            NaCl solution. If the approach of the discs has reached
            its highest value, the layer between the discs is called
            the residual layer. The speed of attraction depends on the
            radius of the discs. The thickness of the residual layer
            is influenced by the composition of the liquids and the discs,
            the pressure and the temperature. The influence of the
            temperature is shown in Figure 3. The thickness of the re-

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The Investigation of the Boundary Friction and Adhesion with the Purpose of
Studying the Interaction of Highly Dispersed Particles. 1. Some Boundary
Properties of Solutions in Narrow Flat Clearances Between Solid Planes.

sidual layer decreases with an increase in specific pressure
(Fig. 3, Table 3). The resistance of the residual layer
against thinning in the presence of surface-active substances
is shown in Figure 4. It varies usually between 0.8 and 12
kg/sq cm. The loosening of the discs in electrolyte solutions
and surface-active substances depends on the time of contact
and the pressure. The coefficient of boundary thickening
changes in a similar way (Fig. 6). This coefficient for LiCl
solutions increases with the concentration of the solution
(Fig. 7). The boundary viscosity is 1-6 times higher than
space viscosity.
There are 5 tables, 8 graphs, and 27 references, 18 of which
are Soviet, 7 English and 2 German.

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The Investigation of the Boundary Friction and Adhesion with the Purpose of Studying the Interaction of Highly Dispersed Particles. 1. Some Boundary Properties of Solutions in Narrow Flat Clearances Between Solid Planes.

ASSOCIATION: Nauchno-issledovatel'skiy institut chasovoy promyshlennosti, Moskva (Scientific Research Institute of the Watch Industry, Moscow)

SUBMITTED: May 27, 1957

1. Solutions--Boundary layers   2. Liquids--Adhesion   3. Solids --Adhesion   4. Adhesion--Measurement   5. Lubricants--Test methods

Card 3/3

AUTHORS: Fuks, G. I., Kaverina, N. I.   SOV/20-121-2-35/53

TITLE: The Influence of the Cation Radius Upon the Properties of the
                Boundary Layers of Electrolyte Solutions in Clearances Between
                Plane Surfaces of Quartz (Vliyaniye radiusa kationov na
                svoystva granichnykh sloyev rastvorov elektrolitov v ploskikh
                zazorakh mezhdu poverkhnostyami kvartsa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 2, pp. 322 –
                325 (USSR)

ABSTRACT: A very weak solution of the chlorine salt of alkali metals or
                earth alkali metals is brought between two plane parallel
                specular quartz disks; the disks are pressed together (load
                unto 8 kg/cm^2 during 3 – 9 hours). The boundary layer which is
                equal to half of the width of the clearance between the disks
                is measured, furthermore the thickness of the remaining layer
                is measured which is equal to half of the solution layer which
                cannot be pressed out of the free space between the plates;
                then the ratio of the viscosities η_0/η and the resistance of the
                residual layer to compression

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The Influence of the Cation Radius Upon the Properties of the Boundary
Layers of Electrolyte Solutions in Clearances Between Plane Surfaces of Quartz

$$\bar{E}_{\sigma'_p-\sigma''_p} = \frac{h'_{min}(\sigma''_p - \sigma'_p)}{h'_{min} - h''_{min}}$$

is determined; h'_{min} and h''_{min} denote the thickness of the
boundary layer at specific loads σ'_p and σ''_p. Then the dimension-
less coefficient Ψ of the boundary thickening is determined to
be specified by $\Psi = (t_{pull} \cdot \sigma_{pull})/\eta$, where t_{pull} is the time
during which a tensile stress is applied and σ_{pull} is the
tensile stress. (The thickness of the investigated boundary
layer did not exeed 0.35μ). Numerous results of such in-
vestigations and of the relations between the various factors
are given. The influence of the temperature on the magnitude
of Ψ shows that Ψ partly increases exponentially with the
temperature. Investigations of the dependence of the thickness
of the boundary layer of $0.01n$- electrolyte solutions showed
that h_{min} is the highest when monovalent cations are used.

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The Influence of the Cation Radius Upon the Properties of the Boundary
Layers of Electrolyte Solutions in Clearances Between Plane Surfaces of Quartz

(LiCl - $0,26\mu$, maximum value); $BaCl_2$ has the lowest value of
h_{min}. Also $\bar{E}$ reaches higher values for monovalent cations than
for bivalent ones, but here LiCl has the lowest value of $\bar{E}$ and
RbCl the highest one (concentration: 10 mg-equ/l at $20^{\circ}C$).
There are 4 figures, 2 tables, and 11 references, 10 of which
are Soviet.

PRESENTED: March 7, 1958, by P. A. Rebinder, Member, Academy of Sciences,
               USSR

SUBMITTED: February 28, 1958

Card 3/3

LOSIKOV, Boris Vital'yevich, prof., doktor tekhn.nauk; PUCHKOV, Nikolay
Gavrilovich, kand.tekhn.nauk; ENGLIN, Boris Abramovich, kand.tekhn.
nauk; FUKS, G.I., kand.khim.nauk; KAVERINA, N.I., kand.tekhn.nauk;
L'VOVA, L.A., vedushchiy red.; FEDOTOVA, I.G., tekhn.red.

[Principles of the use of petroleum products] Osnovy primeneniia
nefteproduktov. Izd.2., dop. i perer. Moskva, Gos.nauchno-tekhn.
izd-vo neft. i gorno-toplivnoi lit-ry, 1959. 566 p. (MIRA 12:3)
(Petroleum products)

5(4).

SOV/69-21-4-22/22

AUTHOR: Fuks, G.I.

TITLE: Problems of Colloid Chemistry at the VIII Mendeleyev Conference

PERIODICAL: Kolloidnyy zhurnal, Vol XXI, 1959, Nr 4, pp 509-511 (USSR)

ABSTRACT: The VIII Mendeleyev Conference of General and Applied Chemistry was held in Moscow from 16 to 23 March 1959. The conference paid much attention to problems of colloid chemistry. Reports on the solvation of ions and molecules and the structure of the double layer of adsorbed ions were delivered at the section on electrochemistry. At the section on chemistry and technology of polymers, reports were delivered on the mechanical properties of polymers with fillers. At the section on chemistry and technology of silicates reports on the properties of argillaceous suspensions were made. The subsection "catalysis and adsorption" of the section of physical chemistry devoted one of its sessions (11 reports) to problems of physical adsorption and ion exchange. The section on

Card 1/13   colloid chemistry conducted 6 sessions (one was a joint

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Problems of Colloid Chemistry at the VIII Mendeleyev Conference

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session with the section of silicate chemistry), at which 57 reports and communications were delivered. The sessions were attended by 70 to 250 delegates, and the joint session by more than 600. The sessions of the section were crowded, which limited the discussions. The reports of the section were focussed on the following problems: 1) surface layers and thin films; adhesion (10 reports); 2) adsorption and adsorptional interaction (11 reports); 3) emulsion and foams (7 reports); 4) formation of colloids, strength and coagulation (11 reports); 5) physico-chemical mechanics and structurizing processes (11 reports); 6) semicolloids and disperse systems in polymers (7 reports). Each of these problems was discussed at a special session of the section. The reports of V.P. Smilga and B.V. Deryagin were devoted to the role of electrons in the adhesion theory, and the reports of N.A. Krotova and L.P. Morozova were on adhesional connection and the methods of its investigation. Yu.F. Deynega, A.V. Du-

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                manskiy, G.V.Vinogradov and I.Ye. Neymark delivered reports
on the effect of the surface and its modification on the
dielectric properties of some disperse systems. V.V. Karasev
and B.V. Deryagin reported on new results in the measuring of
the viscosity of fine wall (pristennyy) layers of a liquid
with the aid of the viscometric blowing out method. G.I. Fuks
reported on the results of model investigations of elemen-
tary acts of interaction of solid particles in electrolyte
solutions and showed the influence of electrostatic repulsion
of diffuse layers, of hydrated ions and the surface properties
of particles on this effect, in dependence on the distance
between the particles. M.S. Ostrikov reported on his method
of visual investigation of the development and "self-heal-
ing" ("samozalechivaniye") of cracks in transparent material
at the change of the load. With the aid of this method the
author modelled and studied drying and soaking processes of

Card 3/13   disperse and high-molecular systems. The report of S.I. Popel'

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was on the interphase tension of iron at the interface with
a silicate smelt (measuring by the form of the drops), and
the report of N.V.Pertsov was on the surface activity of
liquid metallic coverings and their effect on the strength
of the metals. A number of reports on adsorption and ad-
sorptional interaction were concerned with the theoretical
and practical aspects of this problem. Deep-seated pitch
coals, which are taking on an ever-increasing importance
in the national economy of the Belorusskaya and adjacent
oblasts, were minutely characterized in the work of N.F.
Yermolenko and Z.A. Krivchik, who reported on the structure
and the adsorptional activity of these coals. A.B. Taub-
man and S.A. Nikitina considered the role of the kinetic
factor in adsorption and wetting phenomena and showed, that
for the practical use of wetting agents for the interception
of dust their efficiency can be determined not so much by
Card 4/13   high surface activity under static conditions as by the ca-

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pacity of quickly forming equilibrium adsorption layers.
P.I. Yermilov told of his studies into the dependence of
the efficiency of alkylphenol polyethyleneglycol ether
solutions on their structure. I.Ye. Neymark reported on
the results of his study of the effect of chemical modifi-
cation of mineral sorbent surfaces on the adsorptional pro-
perties of the sorbents. P.V. Moryganov considered the thermo-
dynamics of the dyeing process of cellulose fibers, B.N.
Mel'nikov proposed equations for the description of the
kinetics of fiber dyeing. V.F. Androsov described the effect
of different factors on the selection of sols from vats
by synthetic fibers (caprone and nitron). A.A. Kharkharov
reported on his investigations in the field of dyeing syn-
thetic fibers (nitron and lavsan) with soluble and inso-
luble dyestuffs. The reports of A.A. Morozov, R.M. Dranit-
skaya and Ye.K. Tsuguy on the division of green and violet
modifications of chromium sulfate and the report of G.V.
Card 5/13   Nemirov on the sorption on cellulose from aqueous solutions

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of some salts concerned special problems of adsorption
of electrolytes and the properties of adsorbents. The
communication of Ye.M.Kazakov and G.A. Kitayev on electron-
microscopic investigations of the film formation mechanism
of copper hydroxide on a solid surface belonged to the group
of reports devoted to the problem of adsorptional interaction.
Although for formal reasons the session of the section deal-
ing with the problem "emulsions and foams" was opened with a
report of V.F. Boyko, the investigations of this author ex-
ceed the limits of this problem and are devoted to the de-
velopment of a method of plotting diagrams, which show com-
position, state and properties of multicompound disperse
systems. Ye.M. Aleksandrova, V.N. Tsvetkov and N.S. Razumik-
hina reported on their works concerning non-electrolytic co-
agulation of polystirole latexes. The report of A.I. Yurz-
henko and P.V. Kucher was devoted to some peculiarities in
the course of chain reactions in hydrocarbon emulsions sta-

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bilized by surface-active emulsifiers. A.B.Taubman and A.F. Koretskiy reported on the role of the structuro-mechanical properties of adsorbed layers in the stabilizing action of solid emulsifiers. M.A. Korbuz delivered a report on "the Role of the Emulsifier as Kinetic Factor of Emulsional Acidification of Hydrocarbons". S.M. Levi reported on the investigation of structuro-mechanical properties of gelatine and photographic emulsions, which permit the establishment of a number of dependences necessary for the development and substantiation of the technology of spreading light-sensitive emulsions on supports. M.B. Radvinskiy reported on the mechanism of the effect of chemical foam-extinguishers and proposed a new scheme of production of an efficient foam extinction device applicable to systems which boil under pressure. The report of the head of the Dutch school of colloid chemistry, G.Kruyt (G.Kroyt), which opened the discussion of the problem of formation and stability of colloids showed the

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Problems of Colloid Chemistry at the VIII Mendeleyev Conference

relativity of the border between simple and polymeric molecules. The Yugoslav chemist B. Težak reported on investigations intended for the design of plane and volumetric models of disperse systems, which are in the process of sedimentation. Z.Ya. Berestneva and V.A. Kargin reported on the crystallization mechanism of colloid titanium dioxide. This work appeared as the continuation of a series of electron-microscopic investigations of the authors, intended to clarify the mechanism of formation of colloid particles. B.V.Deryagin delivered two reports. In the first of these, original devices for the investigation of disperse systems or surface particles in the flow (flow ultramicroscope, flowmeter of condensation nuclei etc) were described. In the second report, he considered the peculiarities of

heterocoagulation, the elements of the theory of this effect, and he described model experiments, which confirm the foundation of the theory. Yu.M. Glazman and D.N. Stra-

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zhesko delivered a report on "the Significance of Adsorptional Phenomena in the Mechanism of Coagulation of Lyophobic Salts by Electrolytes". In his report on the preparation and the properties of concentrated metal salts, E.M. Natanson generalized his prolonged research in this field and pointed to a number of practical applications of metal sols. The communication of S.G. Teletov was devoted to the results of the investigation of the reversibility of hydrosol Fe_2O_3 - dry gel, and to the effect of copper acetate on this process. In his report S.Ye. Kharin (on the example of colophony salts and transformer oil emulsions) considered the applicability of thermodynamic methods for the description of the stability of equilibrium (more correctly - conditional equilibrium...) colloid systems. K.S. Lyalikov reported on investigations of the recrystallization process of polydisperse systems stabilized against aggregation. In the report of P.M. Silin the theoretical and experimental investigations of the author in the field of saccharose crystalli-

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Problems of Colloid Chemistry at the VIII Mendeleyev Conference

zation were generalized. Problems of physico-chemical mecha-
nics and structurizing processes were discussed at the joint
session of the sections of colloid chemistry and silicate
chemistry. The discussion was opened with a report of P.A.
Rebinder "Basic Problems of Physico-chemical Mechanics of
Disperse and High-Molecular Structures". Ye.Ye. Segalova
reported on her works in the field of the kinetics of the
development of crystallization structures and of the in-
crease of their stability. O.I.Luk'yanova reported on the
structuro-chemical conditions of stabilization of sulfates
by hydration, and Ye.B. Andreyeva - on crystal structuriza-
tion of calcium hydrochlorine aluminate. M.P. Volarovich and
I.V. Churayev reported on the results of
the investigation of the physico-chemical properties and
the structure of peat, with the aid of radioactive isotopes.
In the reports of N.V. Mikhaylov and Ye.Ye. Kalmykova, and in

Card 10/13   those of N.V. Mikhaylov, the physico-chemical theory of

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Problems of Colloid Chemistry at the VIII Mendeleyev Conference

concrete and its individual applications were further de-
veloped. The structurizing role of fillers in the cement
paste was demonstrated. O.P. Mchedlov-Petrosyan, F.A. La-
tyshev, A.G. Bunakov and N.A. Levchuk reported on "the
Thermodynamic Investigation of Cement Vibro-Activation".
The author considered the mechanism of the hardening of
variously-composed cements. G.I. Logginov reported on the
rules governing the binding of calcium oxide with quartz
sand. The report of G.V. Tsitsishvili, D.N. Barnabishvili
and K.Ye.Avaliani was devoted to the adsorptional pro-
perties and the structure of montmorillonites. The physico-
chemical foundations of the formation of a metallo-ceramic
body were set forth in the report of V.N. Yeremenko. The
reports on semicolloid and disperse systems in polymers con-
cerned specified, but important practical or theoretical
aspects of these problems. To this category belonged the
Card 11/13   report of V.I. Yakimova, S.L. Talmud and K.P. Mishchenko

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on the interaction of cellulose with liquids, the communi-
cation of M.I, Knyaginichev and Yu.R.Bolkhovitina on the
properties of starch in salt solutions, and the report of
A.A. Morozov and S.N. Stavrov on the results of the investi-
gations of cation-substituted specimens of Black Sea agaroid
and White Sea agar-agar. L.I.Belen' kiy, M.Ye. Kazanskaya and
T.V. Bromberg reported on their work in the field of dye-
stuff absorption spectra. The displacement phenomena of
these spectra permitted evaluation of the molecular inter-
action in semicolloid systems. E.V.Frisman reported on the
application of the method of investigation of double light
refraction for the determination of the form of macromole-
cules in the solution. A.P. Demchenko reported on "Lyophilic
Property and Some Problems of the Theory of Directed Deter-
gent Synthesis". The work of the section of colloid chemistry
was summarized in a conclusive report of its heat P.A. Re-

Card 12/13   binder. In its decisions, the section welcomed the success-

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Problems of Colloid Chemistry at the VIII Mendeleyev Conference

ful development of applied and theoretical colloid chemistry in the Soviet Union. The work of the section of colloid chemistry of the VIII Mendeleyev Conference number and significance of delivered reports yielded little to the work of normal conferences on colloid chemistry, despite the fact that the last of this kind was held in Tbilisi less than a year ago. The volume of "Kolloidnyy zhurnal" does not correspond to such a development of the science of colloids, which leads to considerable delays in the publication of the works. The section appealed to the AS USSR to increase the volume of Kolloidnyy zhurnal by no less than 50%. Welcoming the rise of a new branch of science, physico-chemical mechanics, the section appealed to the AS USSR to speed up the organization of an institute of physico-chemical mechanics. In its decisions, the section also posed the problem of the organization of a permanent-working colloquium on colloid chemistry and planned for the organization of a normal conference on colloid chemistry in 1961.

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"APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000513830003-8

FUK[illegible], G.I.

report presented at the 1st All-Union Congress of Theoretical and Applied Mechanics, Moscow, 27 Jan - 3 Feb '60.

303. G. I. Fuks (Moscow): Investigation of the visco-plastic flow of structurized systems (lubricants, clays, etc.) by the differential method.
304. [illegible] Kharimov (Moscow): Experimental investigation of the strain distribution in soil layers under foundations of varying dimensions.
305. A. A. Khachatrian (Erevan): On the stability and vibrations of anisotropic plates and shells.
306. T. T. Khachatrian (Erevan): On the theory of thick plates.
307. B. G. Khlebnikov (Lvov): Some biharmonic problems concerning an infinite strip with reinforced edges.
308. N. J. Hoff (Stanford): Reversed creep: a remark to the creep buckling theory of Rabotnov and Shesterikov.
309. K. M. Khuberian (Tbilisi): Minimum weight forces in a redundant truss designed for combined loading.
310. [illegible] (Rostov-on-Don): The stability of thin-walled bars under combined compression, flexure, and torsion.
311. I. A. Tsurkov (Moscow): The non-linear equations of the general theory of shells for small elastic-plastic deformations and their linearization in the method of elastic solutions.
312. N. A. Tsytovich (Moscow): The physical foundations of the mechanics of frozen soils.
313. K. F. Chernykh (Leningrad): Saint Venant's problem for thin-walled toroidal tubes.
314. [illegible] Cherniak (Kiev): On some properties of the tension diagram of metals in the range of small elastic-plastic deformations.
315. K. S. Chobanian (Erevan): A two-dimensional problem concerning elastic bodies with a reinforced surface.
316. [illegible] Chuvikovskii (Leningrad): On the forced transverse vibrations of a ship hull.
317. [illegible] (Ordzhonikidze): On the integration of the equations of the plane problem of plasticity.
318. [illegible] (Dnepropetrovsk): Stability of regular structures and plates.
319. G. S. Shapiro (Moscow): On the limit equilibrium of shells of revolution.
320. [illegible] (Moscow): A contribution to the formulation of problems concerning anisotropic plastic solids.
321. [illegible] Shevchenko (Moscow): Solutions of some three-dimensional problems of plasticity with application to the rolling of metals.
322. M. P. Sheremetev (Lvov): The solution of some contact problems of elasticity (equation of Prandtl type).
323. D. I. Sherman (Moscow): A heavy medium weakened by an elliptical cavity.
324. D. I. Sherman (Moscow): The method of integral equations in static problems of elasticity.
325. B. F. Shorr (Moscow): Creep of non-uniformly heated bodies.
326. [illegible] (Moscow): Automodeled motions of a perfectly plastic medium.

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000513830003-8"

FUKS, G. I.

Reduction in the hardness of quartz and ruby induced by adsorption in solutions of neutral electrolytes. Koll. zhur. 22 no.2:256-258 Mr-Ap '60.   (MIRA 13:8)

1. Nauchno-issledovatel'skiy institut chasovoy promyshlennosti, Moskva.
         (Quartz)   (Rubies)

FUKS, G.I.; MIKHAYLYUK, A.S.

Measurements of boundary friction and adhesion, designed to
determine the interaction of highly disperse particles. Part 3:
Effect of neutral electrolytes on the friction of quarts, ruby
and agate at high contact pressures. Koll. zhur. 22 no. 6:720-
729 N-D '60.   (MIRA 13:12)

1. Nauchno-issledovatel'skiy institut chasovoy promyshlennosti,
Moskva.

    (Quarts)   (Agates)   (Rubies)

80068

5.4400

AUTHOR: Fuks, G. I.

S/020/60/132/01/043/064
B004/B007

TITLE: The Mechanisms of the Action of Neutral Electrolytes on the Cohesion
             of Particles in a Coagulation Structure

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 132, Nr 1, pp 164 - 167 (USSR)

TEXT: The author investigated the influence of electrolytes on the interaction of
particles by measuring the thickness and the resistance of the boundary layer of
electrolyte solutions between polished plane-parallel quartz disks (Ref 4) and
by measuring the friction of a spherical surface of negatively-charged quartz and
positively-charged ruby in the electrolyte (Ref 5). The distance between the
quartz disks was varied between 3 - 5 and 0.02 μ and measured. Contact pressure
was between 0.04 - 10 kp/cm^2. The kinetic cohesion of the quartz disks and the
time of their separation depends, as shown by table 1, on the composition of the
solution. It follows from table 2 that also the thickness of the remaining
layer depends on the composition of the solution. From the data obtained the
author draws the conclusion that the distance between the quartz disks depends
on the thickness of the diffuse layers of adsorbed ions and on the interaction
of these layers. For the repulsion of the diffuse layers equations were derived

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The Mechanisms of the Action of Neutral
Electrolytes on the Cohesion of Particles
in a Coagulation Structure

by B. V. Deryagin (Ref. 8) and A. N. Frumkin (Ref. 9). The author gives the
equation in a new form. $F_r = KZ^2C \exp(-hKZ\sqrt{C})$, where F denotes the repulsive
force of the conjugate diffuse layers, Z - the ion charge, C - concentration,
and h - the distance between the surfaces. Fig. 2 confirms the agreement of
experimental data with the values calculated according to this equation for
electrolyte concentrations up to 8 - 10 mg-equ/l. In concentrated solutions
non-electrostatic factors of interaction occur, probably because of further
or secondary hydration of the ions (Refs. 10, 11). Table 3 gives the coeffi-
cients of friction of ruby and quartz in 0.001 N solutions of neutral electro-
lytes. The data do not follow the equation derived for the repulsive force.
The coefficient of friction depends on the charge number of anions and cations,
which indicates the participation of ions not bound to the surface. Fig. 3
shows the dependence of the coefficient of friction of ruby and its wear upon
its microhardness which is differently influenced by the electrolytes. There
are 3 figures, 3 tables, and 13 Soviet references.

Card 2/3

The Mechanisms of the Action of Neutral
Electrolytes on the Cohesion of Particles
in a Coagulation Structure

S/020/60/132/01/43/064
B004/B007

ASSOCIATION: Nauchno-issledovatel'skiy institut chasovoy promyshlennosti
(Scientific Research Institute of the Clock- and Watch Industry)

PRESENTED: December 8, 1959 by P. A. Rebinder, Academician

SUBMITTED: December 1, 1959

Card 3/3

FUKS, G.I.

PHASE I BOOK EXPLOITATION   SOV/5055

Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh. 3d,
1958.

Gidrodinamicheskaya teoriya smazki. Opory skol'zheniya. Smazka
i smazochnyye materialy (Hydrodynamic Theory of Lubrication,
Slip Bearing, Lubrication and Lubricant Materials) Moscow,
Izd-vo AN SSSR. 422 p. Errata slip inserted. 3,800 copies
printed. (Series: Its Trudy, v. 3)

Sponsoring Agency: Akademiya nauk SSSR. Institut mashinovedeniya.
Resp. Eds. for the Section "Hydrodynamic Theory of Lubrication
and Slip Bearing": Ye. M. Gut'yar, Professor, Doctor of Tech-
nical Sciences; and A. K. D'yachkov, Professor, Doctor of Tech-
nical Sciences. Resp. Ed. for the Section "Lubrication and
Lubricant Materials": O. V. Vinogradov, Professor, Doctor of
Chemical Sciences; Ed. of Publishing House: M. Ya. Klebanov;
Tech. Ed.: O. M. Gus'kova.

PURPOSE: This collection of articles is intended for practicing
engineers and research scientists.

COVERAGE: The collection, published by the Institut mashino-
vedeniya, AN SSSR (Institute of Science of Machines, Academy
of Sciences, USSR) contains papers presented at the III
Vsesoyuznaya konferentsiya po treniyu i iznosu v mashinakh
(Third All-Union Conference on Friction and Wear in Machines)
which was held April 9-15, 1958. Problems discussed were in

                                                    SOV/5055

Hydrodynamic Theory (Cont.)

Kuliyev, A. M. Results of the Work of the AzNII NP
(Azerbaydzhan Scientific Research Institute of the
Petroleum Industry) in the Field of Synthesis, Investi-
gation, and Application of Additives to Lubricating Oils   366

Buchkov, N. G., M. S. Borovaya, and V. D. Reznikov. Change
in the Chemical Composition and in the Operating Properties
of Oils During Use in an Engine   373

Ramayya, K. S., and K. Kh. Sil'n. Mechanism of the
Corrosin Activity of Oils and the Protective Action
of Additives   381

Puks, G. I., M. Ye. Gal'tsova, P. Ya. Kiryushov,
A. Y. Shakhtyryuk, and I. I. Gad. On the Applicability
of Synthetic Esters as Lubricant Materials   386

Fuks, G. I., and N. I. Kaverina. Lubricating Capacity and
Properties of the Boundary Layers of Oils (Physical Signi-
ficance and Characteristics of the Lubricating Capacity of
Oils)   397

Klimov, K. I., and P. F. Zarudniy. Mechanical Destruc-
tion of Solutions of Polymers in a Flow (Published in
1959 under the title: "Mechanical Destruction of Solu-
tions of Polyisobutylene in Mineral Oils" ("Khimiya i
tekhnologiya topliv i masel", No. 2, 1959)   408

Pavlov, V. P. Elastic-Endurance Properties of Lubricant
Materials ("Izv. AN SSSR, OTN," "Mekhanika i mashino-
stroyeniye" No. 2, 1959)   408

Pirsanova, Ye. N., and S. G. Arabyan. Development of an
Accelerated-Engine Method for Testing Oils for Diesel
Tractors ("Traktory i sel'khozmashiny", No. 9, 1958)   408

EMINOV, Ye.A.; OSHER, R.N.; PATSUKOV, I.P.; CHEKAVTSEV, N.A.; MAZYRIN, I.V.;
  FUKS, G.I.; VLADZIYEVSKIY, A.P.; PATSUKOV, I.P.; AVDEYEV, A.V.;
  LOPOYAN, G.S.; PETROV, G.G.; KOZOREZOVA, A.A.; LISITSKIY, K.Z.;
  YAKOBI, M.A.; BELYANCHIKOV, G.P.; IVANOV, V.S.; VORONOV, N.M.; RU-
  MYANTSEV, V.A.; ZILLER, G.K.; BEREZHNAYA, V.D.; LEVINA, Ye.S.,
  vedushchiy red.; TROFIMOV, A.V., tekhn.red.

[Manual on the uses and consumption standards of lubricants] Spra-
vochnik po primeneniiu i normam raskhoda smazochnykh materialov.
Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry,
1960. 703 p.   (MIRA 13:4)
          (Lubrication and lubricants)

PUTILOVA, Iya Nikolayevna; Prinimal uchastiye FUKS, G.I.   PAVLOVA,
        N.N., red.; GOROKHOVA, S.S., tekhn.red.

        [Laboratory manual of colloid chemistry] Rukovodstvo k prakti-
        cheskim zaniatiiam po kolloidnoi khimii (glavy 7-9 sost.G.I.Fuks).
        Izd.4., perer. i dop. Moskva, Gos.izd-vo "Vysshaia shkola,"
        1961. 341 p.   (MIRA 15:5)
                        (Colloids)

DERYAGIN, B.V., otv.red.; ZAKHAVAYEVA, N.N., red.; KROTOVA, N.A., red.;
KUSAKOV, M.M., red.; NERPIN, S.V., red.; PROKHOROV, P.S., red.;
TALAYEV, M.V., red.; FUKS, G.I., red.; BANKVITSER, A.L.,
red.izd-va; RYLINA, Yu.V., tekhn.red.

[Investigations in the field of surface forces; collection of
reports made at the Conference on Surface Forces, April 1960]
Issledovaniia v oblasti poverkhnostnykh sil; sbornik dokladov
na konferentsii po poverkhnostnym silam, aprel' 1960 g. Moskva,
1961. 231 p.   (MIRA 14:4)

1. Akademiya nauk SSSR. Institut fizicheskoy khimii. 2. Chlen-
korrespondent AN SSSR (for Deryagin).
          (Surface chemistry)

1.

15.6000
11.9000

31900
S/645/61/000/000/006/007
E075/E485

AUTHOR: Fuks, G.I.

TITLE: Properties of solutions of organic acids in hydrocarbon
            liquids at solid surfaces

SOURCE: Konferentsiya po poverkhnostnym silam. Moscow, 1960.
            Issledovaniya v oblasti poverkhnostnykh sil; sbornik
            dokladov na konferentsii. Moscow, Izd-vo AN SSSR, 1961.
            At head of title: Akademiya nauk SSSR. Institut
            fizicheskoy khimii. 99-112

TEXT: A number of investigators have shown in the past decade
that surface forces can penetrate liquids to a depth of many
molecular layers.   In the present work, a study is made of the
properties of boundary layers which are formed on solid surfaces
by the hydrocarbon solutions of organic acids.   An attempt is made
to determine the relationship between static or quasi static
properties of the layers, the structure, composition and
concentration of the acids (mainly fatty acids) and the composition
of solvent.   The apparatus used consisted of two flat parallel
discs (diameter 2 to 17 mm) with small holes in the centre.   The
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E075/E485

Properties of solutions of organic ...

discs were thermostated and placed in liquid under study.   The top
disc was rigidly attached to a parallel plate condenser, one plate
of which moves together with the disc.   The capacity changes in an
electric circuit connected to the condenser measured the distance
between the discs in the range of 0.02 to 5 - 10 microns with a
precision of 0.01 microns.   The liquid between the discs was
gradually squeezed out by a pressure (0.08 to 30 kg/cm^2) applied to
the top disc.   The surface finish of the discs was such that the
boundary layers having a thickness greater than 0.02 microns could
be investigated.   Resistance to rotation of one disc relative to
the other was measured by a suitable spring system.   It was shown
in the initial experiments that the rate with which the distance
between the discs decreased, whilst liquid is forced out from the
gap between them, is given by the Stefan-Reynolds equation for
distances above several tens of microns.   However, the rate of
liquid displacement from the gap under a given load decreases
markedly when the distance falls to lower values.   Finally a
residual liquid layer remains between the discs which cannot be
displaced by the pressures used.   Low molecular weight
hydrocarbons investigated (benzene, n-hexane cyclo-hexane,
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E075/E485

Properties of solutions of organic ...

isooctane and n-decane) did not form the residual layers in contrast to mineral oils and hydrocarbon solutions of fatty acids. The load applied to the discs determines the thickness of the residual layer.   Its resistance to further compression grows as the thickness decreases.   When the load is temporarily decreased, the thickness increases; this demonstrates the existence of a cleaving pressure of the residual layers.   The results presented show that: a) the thickness of the residual layer formed from hydrocarbon solutions of fatty acids depends on the chain-length of the acid, molecular structure of the solvent and the nature of solid surface;   b) the thickness of the residual layer is a linear function of the chain length of the hydrocarbon radical; c) the thickness increases with the increasing concentration of a fatty acid dissolved in low-molecular weight hydrocarbons: mineral oils, which themselves form thick residual layers, are less sensitive to this concentration effect;   d) the thickness of oriented layers is affected ("softened") by increasing temperature, slowly at first and more rapidly as the heating progresses; however, at temperatures near 100°C, the layers are still not completely destroyed;   e) solvents take part in the formation
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Properties of solutions of organic ...   E075/E485

of residual layers; it is postulated that the molecules of
solvent are situated between the ends of hydrocarbon chains thus
lowering their interaction; this effect depends on the structure
of solvent molecules;   f) the resistance to displacement (flow) of
the residual layers and, consequently, the static friction under
condition of boundary lubrication, is determined by the thickness
of residual layers;   in this case the role of the fatty acids is to
increase the cleaving pressure (which is proportional to the length
of fatty acid molecules) but for a constant thickness of the layers
the length of the molecules does not influence the static friction.
B.V.Deryagin, M.M.Kusakov, N.I.Kaverina, S.M.Serikova,
N.I.Rydenkov and G.S.Bratova are mentioned in the paper for their
contributions in this field.   There are 13 figures, 2 tables and
21 references: 12 Soviet-bloc, 2 Russian translations from
non-Soviet-bloc publications and 9 non-Soviet-bloc.   The four most
recent references to English language publications read as follows:
Ref.7: A. Moore. Proc. Roy. Soc., Ser. A, 195, 231:
Ref.17: F.Bowden, D.Tabor. The Friction and Lubrication of Solids.
Oxford, 1950; E.Tringle. Trans. Farad. Soc., 1950, no.46, 93:
Ref.18: J.Menter, D.Tabor. Proc. Rov. Soc., Ser. A, 1951, v.204,514,
Card 4/5

31900
S/643/61/000/000/006/007
Properties of solutions of organic .. E075/E485

J. Sanders, D. Tabor, ibid., 525;
Ref.21: J. McBain, Colloid Science. Boston, 1950, 17;
J. Hess. Fette and Seifen, 1939, 46, 572.

ASSOCIATION: NII chasovoy promyshlennosti Gos. Komiteta Soveta
Ministrov SSSR po avtomatizatsii mashinostroyeniya
(NII of the Watchmaking Industry, State Committee of
the Council of Ministers of USSR for the
Automatization of Machinery Construction)

Card 5/5

S/081/62/000/005/078/112
B162/B101

AUTHOR: Fuks, G. I.

TITLE: The mechanism of action and the effectiveness of additives
            which increase the lubricating capacity

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 5, 1962, 527,
            abstract 5M210 (Sb. "Prosadki k maslam i toplivam".
            M., Gostoptekhizdat, 1961, 228-238)

TEXT: This is a critical review. Proof is given as to the polymolecularity
of the boundary layer of a lubricant. On examining the mechanism of the
lubricating action of oils it was concluded that additives which increase
the lubricating capacity of oils are substances which, when added to the
oil, lessen the resistance to the mutual displacement of the contacting
solids and which increase the resistance to the thinning of the boundary
oil layer. When selecting additives it is necessary to take into account
the thickness of the oil layer between the components, the rate of displace-

Card 1/2

The mechanism of action ...

S/081/62/000/005/078/112
B162/B101

ment, the mechanical and chemical characteristics of the solid surfaces, and the composition of the oil. 41 references. Abstracter's note: Complete translation.]

Card 2/2

FUKS, G.I.

Synthetic watch-lubricating oils. Priborostroenie no.5:24-26 My '61.
(MIRA 14:5)
(Clocks and watches--Lubrication)

FUKS, G.I., doktor tekhn.nauk, prof.

Use of tables for calculating the adiabatic process of an ideal gas.
Izv. vys. ucheb. zav.; energ. 5 no.6:123-127 Je '62.   (MIRA 15:6)

1.   Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiy institut
imeni S.M.Kirova. Predstavlena kafedroy teoreticheskoy i obshchey
teplotekhniki.

(Gases)

STREL'TSOV, V.V.; SHCHUKIN, V.K.; REBROV, A.K.; FUKS, G.I.; KUTATELADZE, S.S.;
LYKOV, A.V.; PREDVODITELEV, A.S.; KONAKOV, P.K.; DUSHCHENKO, V.P.;
MAKSIMOV, G.A.; KRASNIKOV, V.V.

Readers' response to I.T. El'perin's article "Terminology of heat and
mass transfer" in IFZh No.1, 1961. Inzh.-fiz. zhur. 5 no.7:113-133
Jl '62.   (MIRA 15:7)

1. Khimiko-tekhnologicheskiy institut, g. Ivanovo (for Strel'tsov).
2. Aviatsionnyy institut, Kazan' (for Shchukin, Rebrov). 3. Poli-
tekhnicheskiy institut, Tomsk (for Fuks). 4. Institut teplofiziki
Sibirskogo otdeleniya AN SSSR, Novosibirsk (for Kutateladze). 5.
Energeticheskiy institut AN BSSR, Minsk (for Lykov). 6. Gosudarstven-
nyy universitet imeni Lomonosova, Moskva (for Predvoditelev). 7.
Institut inzhenerov zheleznodorozhnogo transporta, Moskva (for Konakov).
8. Institut legkoy promyshlennosti, Kiyev (for Dushchenko).
9. Vsesoyuznyy zaochnyy institut pishchevoy promyshlennosti, Moskva
(for Maksimov). 10. Tekhnologicheskiy institut pishchevoy
promyshlennosti, Moskva (for Krasnikov).
        (Heat—Transmission)   (Mass transfer)

L 17699-63   EPR/EWP(j)/EPF(c)/EWT(m)/BDS/ES(w)-2   AFFTC/ASGC/ESD-3/SSD
Ps-4/Pc-4/Pr-4/Pab-4   RM/WW/RH/MAY/DJ   88
                                                      S/0065/63/000/007/0058/0062 87

ACCESSION NR: AP3004220

AUTHORS: Fuks, G. L.; Blekherov, M. M. (Deceased)

TITLE: Approaches to the use of fluorohydrocarbons and chlorofluorohydrocarbons
as highly stable instrument oils

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 7, 1963, 58-62

TOPIC TAGS: hydrocarbon, instrument oil, friction coefficient, fatty acid,
colloid solution, boundary layer

ABSTRACT: Highly dispersed (colloidal) suspensions of up to 0.04% fatty acid in
fluoro- and chlorofluorohydrocarbons were prepared by the condensation method and
with a co-solvent (chloroform or carbon tetrachloride) subsequently distilled off.
The coefficients of friction of steel vs. steel, steel vs. ruby, and, in some
instances, Alloy VK-6 vs. ruby, were then determined for a range of temperatures,
additive concentrations, and numbers of carbon atoms of the fatty acid additive.
It was found that the dispersions prepared are stable and are good lubricants
at temperatures above the melting point of the dispersed fatty acid. It is
postulated that the fatty acid is only able to form the necessary boundary layers
from the molten state. Orig. art. has: 5 figures and 3 tables.
Card 1/2   ASSOCIATION: Scientific Research Institute for the Watch Industry.

FUKS, G.I., doktor tekhn. nauk; FUKS, L.G., inzh.

Concerning an error in the handbook "Engineering thermodynamics"
by M.P. Vukalovich and I,I. Novikov. Izv. vys. ucheb, zav.;
energ. 6 no.9:121-122 S '63.   (MIRA 16:12)

1. Tomskiy ordena Trudovogo Krasnogo Znameni politekhnicheskiv
institut imeni S.M. Kirova. Predstavlena kafedroy teoreticheskoy
i obshchey teplotekhniki.

FUKS, G.I.; NIKOLAYEVA, N.I.

Determination of maximum shear stress by means of a conic plastometer of increased sensitivity. Zav.lab. 29 no.11:1339-1341 '63.

(MIRA 16:12)

1. Nauchno-issledovatel'skiy institut chasovoy promyshlennosti.

ACCESSION NR: AR4015135   S/0124/63/000/012/B122/B122

SOURCE: RZh. Mekhanika, Abs. 12B754

AUTHOR: Fuks, G.I.

TITLE: On the computation of ideal gas mixing processes

CITED SOURCE: Izv. Tomskogo politekhn. in-ta; v.119, 1963, 54-58

TOPIC TAGS: ideal gas, ideal gas mixture, gas mixture

TRANSLATION: The author examines the mixing of ideal gases in the presence of
heat transfer. Section 1 deals with a method of computing all of the mixture
parameters: the temperature, total enthalpy, velocity, el al., which are in-
volved in the mixing of flows of the individual gases. Her it is assumed that
all of the gas parameters prior to mixing, as well as the gas mixture pressure p
and the cross-sectional area of the channel S are given. In Section 2 he pre-
sents the appropriate method of computation for mixing processes in a constant
volume. The computational methods described are based on the use of thermodynamic

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ACCESSION NR: AR4015135

property tables for gases and molar formulas. Because of this, the computational
methods turned out to be relatively simple. V.M. Kuptsov.

DATE ACQ: 31Dec63   SUB CODE: FL   ENCL: 00

Card 2/2

FUKS, G.I.; NIKOLAYEVA, N.I.

    Effect of neutral electrolytes on coagulation interaction in a
suspension of glass globules. Dokl. AN SSSR 153 no.2:398-400
N '63.   (MIRA 16:12)

    1. Nauchno-issledovatel'skiy institut chasovoy promyshlennosti.
Predstavleno akademikom P.A.Rebinderom.

FUKS, G.I.; BRATOVA, G.S.

Effect of organic acids on the boundary friction and
sticking of solids in hydrocarbon liquids. Dokl. AN SSSR
153 no.5:1125-1128 D '63.   (MIRA 17:1)

1. Nauchno-issledovatel'skiy institut chasovoy promyshlen-
nosti. Predstavleno akademikom P.A. Rebinderom.

EMINOV, Ye.A.; SINITSYN, V.V.; OSHER, R.N.; CHEKAVTSEV, N.A.; PATSUKOV,
      I.P.; USOV, A.A.; FUKS, G.I.; VLADZIYEVSKIY, A.P.; AVDEYEV, A.V.;
      ARZUMANOV, Sh.P.; PETROV, G.G.; KOZOREZOVA, A.A.; LISITSKIY,
      K.Z.[deceased]; YAKOBI, N.A.; BELYANCHIKOV, G.P.; IVANOV, V.S.;
      VORONOV, N.M.; RUMYANTSEV, V.A.; TROFIMUK, V.A.; BERSHTADT,
      Ya.A.; ZILLER, G.K.; BEREZHNAYA, V.D.; KLEYMENOVA,K.F., ved.red.;
      TITSKAYA, B.F., ved. red.

[Manual on the use and norms for the expenditure of lubricants]
Spravochnik po primeneniiu i normam raskhoda smazochnykh mete-
rialov. 2. perer. i dop. izd. Moskva, Khimiia, 1964. 855 p.
                              (MIRA 18:3)

FUKS, G.I.

Proof and presentation of the second law in a course of
technical thermodynamics. Izv. TPI 125:8-12 '64.

(MIRA 18:8)

L 4934-66   EWT(m)/EWP(w)/EPF(c)/T/EWP(t)/EWP(b)/ETC(m)   JD/WW/DJ/GS

ACC NR: AT5022676   SOURCE CODE: UR/0000/65/000/000/0228/0232

AUTHORS: Khandel'sman, Yu. M.; Fuks, O. L.

ORG: Scientific Committee on Friction and Lubrication, AN SSSR (Nauchnyy sovet po treniyu i smazkam AN SSSR)

TITLE: Means for decreasing friction torque in miniature sleeve bearings

SOURCE: AN SSSR. Nauchnyy sovet po treniyu i smazkam. Teoriya treniya i iznosa (Theory of friction and wear). Moscow, Izd-vo Nauka, 1965, 228-232

TOPIC TAGS: instrument bearing, instrument pivot, bearing friction, precision bearing

ABSTRACT: Methods for decreasing the friction torque in precision bearings (instrument pivots, etc) by decreasing the shaft diameter or by improving the frictional properties of the pivot materials were investigated. Based on work by N. I. Kol'chin (Mekhanika mashin, t. II M.-L., Mashgiz, 1963) and I. V. Kragel'skiy (O dvuchlennom zakone treniya. Dokl. AN SSSR, 1960, t. 140, No. 5), the friction torque can be expressed as $M_f = M_0 + K r_w P$

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ACC NR: AT5022676

2

(where K = constant, r_{ts} = pivot radius, P = load). This relationship was
experimentally verified by measuring pivot torques (0.3-1.0 mm diameter pivots)
according to the method described by Yu. M. Khandel'sman, V. V. Dokuchalova, and
A. S. Mikhaylyuk (Izmereniye malykh momentov troganiya. Izmeritel'naya tekhnika,
1962, No. 2). Thus, friction torque can be decreased by decreasing the pivot
diameter and by providing overload supports which protect the pivots (0.08-0.15 mm
diameter shafts have been used with overload capabilities to 10 000 grams). The
coefficient of friction is known to be proportional to the contact area and
increases with decreasing clearance. After decreasing the pivot length (to
decrease contact area), it is advisable to provide a curved contact area which
helps to keep liquid lubricants in the contact area. Since the friction coeffi-
cient does not necessarily decrease with improved surface finish (A. S. Akhmatov.
Molekulyarnaya fizika granichnogo treniya. Fizmatgiz, 1963) one should determine
the optimum finish rather than specify the finest finish which can be provided.
A survey of lubrication methods has been presented previously (G. I. Fuks and L. V.
Timofeyeva. Kachestvo i primeneniye pribornykh masel i smazok. TsBTI, 1959).
The work has resulted in the development of bearings with friction torques on
the order of 0.001 gm·cm and centering accuracy of 0.002 mm. Orig. art. has: 1
table, 4 figures, and 4 formulas.

Card 2/3

L 4934-66
ACC NR: AT5022676

SUB CODE: IE, MT/   SUBM DATE: 18May65/   ORIG REF: 007

Card 3/3

FUKS, G.I., prof., doktor; LYALIKOV, A.S.

Calculation of the overheating of the winding surfaces of the additional resistances of electric measuring instruments. Izv.TPI 137:3-12 '65.

Concise method for calculating the overheating of resistor winding surfaces of electric measuring instruments. Ibid.: 13-21.   (MIRA 19:1)

LYALIKOV, A.S.; FUKS, G.I., prof., doktor; LONINOV,G.D.

Selection of additional resistances of electric measuring instruments according to their power rating and hull characteristics. Izv.TPI 137:22-24 '65.

(MIRA 19:1)

FUKS, G.I.

25674

Stepen' sovershenstva Teplosilovoy Ustanovki Izvestiya Tomskogo Politekhn.   in-ta
im. Kirova, T. LXVI, VYP. 2, 1948, s. 91-112-Bibliogr: 16 Nazv.

SO: LETOPIS' No. 34

FUKS, G.I.

25673

Raschet Adiabaticheskogo I. Politropicheskikh Protsessov Po Sredney Teploemkosti
Izvestiya Tomskogo Politekhn. in-ta im. Kipova, T. LXVI, VYP. 2, 1948, s. 113-19.

SO: LETOPIS' No. 34

FUKS, G.I.

25671

K Voprosv O Postroenii univepsal'noy Teplovoy diagrammy ideal'nogo gaza.   Izvestiya
Tomskogo Politekhn.   in-ta im.   Iorva, T. LXVI, VYP. 2, 1948, s. 121-25.

SO: LETOPIS' No. 34

FUKS, G.I.

25672

Nekotorye Vozmozhnosti Uvelicheniya Otdachi Teplovykh Ustanovok. Izvestiya Tomskogo
Politekhn.   in-ta Kirova, T. LXVI, VYP. 2, 1948, s. 127-43.-Bibliogr. 6 Nazv.

SO: LETOPIS' No. 34

FUKS, G. I.
Professor.-doktor

F.R
El.R
D.R
E3.R
C2aa.R

Tomskiy politekhnicheskiy institut.
" Konferentsiya po voprosam partiynosti nauki" .
Report about technical thermodynamics.

Source: Vestnik Vysshey Shkoly, No. 6, 1949, p. 57.
           Izdatel'stvo, " Sovetskaya Nauka" .

FUKS, G.I., doktor tekhnicheskikh nauk. (Reviewer)

"Technical thermodynamics." M.P.Vukalovich, I.I.Novikov. Reviewed by G.I.Fuks. Elek.sta. 25 no.2:62-64 F '54.   (MLRA 7:2)
     (Vukalovich, M.P.) (Novikov, I.I.) (Thermodynamics)

F. NS, G. I

AID P - 2772

Subject   :   USSR/Engineering

Card 1/1   Pub. 110-a - 14/14

Author   :   Fuks, G. I., Doc. Tech. Sci., Prof.

Title   :   H. I. Belokon' "Termodinamika" (Thermodynamics)
                  Gosenergoizadt 1954 (Book Review)

Periodical   :   Teploenerg., 9, 63-64, S 1955

Abstract   :   The book reviewed is criticized for some new theories
                  presented by the author and is considered to be of
                  little value to students because of its erroneous
                  statements.

Institution   :   None

Submitted   :   No date